

CLAIMS

We claim:

- 1 1. A method for utilizing vaporizable liquid fuels, residues and waste by
2 gasification of said fuels, residues and waste to recover in a post gasification processing,
3 useful products from a gasified form of the fuels, residues and waste, comprising:
4 heating the fuels, residues and waste to completely vaporize said fuels, residues and
5 waste to a vapor form ; and
6 reacting a feed of the vapor form of said fuels, residues and waste with a gasifying
7 medium containing free oxygen in a gasification reaction zone at a temperature of at least about
8 900° C. to provide the gasified form of said fuels, residues and waste.
- 1 2. The method as claimed in claim 1 in which the fuels, residues and waste are
2 reacted at a temperature in a range of about 1100° C. to about 1600° C.
- 1 3. The method as claimed in claim 1, in which the fuels, residues and waste are
2 vaporized by directly contacting the fuels, residues and waste with a heated fluid, the heated
3 fluid delivering the fuels, residues and waste to the gasification reaction.
- 1 4. The method as claimed in claim 3, in which the heated fluid is steam.

1 5. The method as claimed in claim 1, in which the fuels, residues and waste are
2 vaporized in an indirect heat exchange operation with a heating medium and fed in gaseous
3 form to the reaction zone.

1 6. The method as claimed in claim 1, in which the fuels, residues and waste are
2 vaporized by passing a feed of the fuels, residues and wastes in company with a feed of steam
3 through a venturi tube.

1 7. The method as claimed 6, in which the fuels, residues and waste are introduced
2 into the venturi tube at a location upstream of a location of a narrowest cross section of the
3 venturi tube, the steam being introduced upstream of said location of fuels, residues and wastes
4 introduction.

1 8. The method as claimed in claim 1, in which steam is added to the gasifying
2 medium.

1 9. Apparatus for gasifying liquid fuels, residues and waste, comprising;
2 a gasification reactor, the gasification reactor including a gasification burner;
3 a prevaporization chamber upstream of the gasification reactor;
4 means for supplying a feed of the fuels, residues and waste into said prevaporization
5 chamber;

6 means for supplying a feed of steam into said prevaporization chamber for completely
7 vaporizing the liquid fuels, residues and waste to vapor form, said prevaporization chamber
8 communicating with said gasification reactor so that the vapor form fuels, residues and waste,
9 and the steam pass into the gasification reactor; and

10 means for supplying a gasifying medium to said gasification reactor, the vapor form
11 fuels, residues and wastes reacting with the gasifying medium in the gasification reactor to
12 provide a gasified form of said fuels, residues and waste.

1 10. The apparatus as claimed in claim 9, in which the gasification burner includes
2 an annular passage and a burner mouth at which said annular passage outlets, the vapor form
3 fuels, residues and waste passing from the prevaporization chamber through said annular
4 passage for outletting at said burner mouth at which the gasification reaction occurs; and
5 a central tube in which the gasifying medium flows to the burner mouth.

1 11. The apparatus as claimed in claim 9, comprising
2 a vessel, the prevaporization chamber and the gasification reactor being arranged in
3 succession in-line in the vessel; and
4 a common feed tube extending from an end of the vessel, the feed tube communicating
5 with the prevaporization chamber, the feed of fuels, residues and waste, and the feed of steam
6 being delivered to said prevaporization chamber through said common feed tube, the means for

7 supplying gassifying medium being at least one pipe extending through the shell into the
8 gasification reactor.

1 12. The apparatus as claimed in claim 9, in which the pevaporization chamber
2 comprises a venturi tube, the means for supplying the feed of fuels, residues and waste being
3 connected to the venturi tube upstream of a narrowest cross-section of said venturi tube, the
4 means for supplying a feed of steam being connected to the venturi upstream of the connection
5 of the means for supplying fuels, residues and waste.

1 13. Apparatus for gasifying liquid fuels, residues and waste, comprising:
2 a gasification reactor;
3 a gasification burner in the gasification reactor, the gasification burner having an inlet;
4 a heat exchanger, the heat exchanger having an inlet;
5 means for supplying a flow of liquid fuels, residues and waste to said heat exchanger
6 inlet for flow passage thereof through the heat exchanger, said heat exchanger having an outlet;
7 means for supplying a flow of a heating medium through said heat exchanger in a
8 indirect contact with said fuels, residues and waste to heat said fuels, residues and waste and
9 completely vaporize said fuels, residues and wastes to vapor form;
10 means for connecting the heat exchanger outlet with the gasification burner inlet so that
11 vapor form fuels, residues and waste flow to the gasification burner; and

12 means for supplying a feed of gasification medium to the inlet of said gasification
13 burner.

1 14. The apparatus of claim 13, in which the heating medium is a feed of steam.